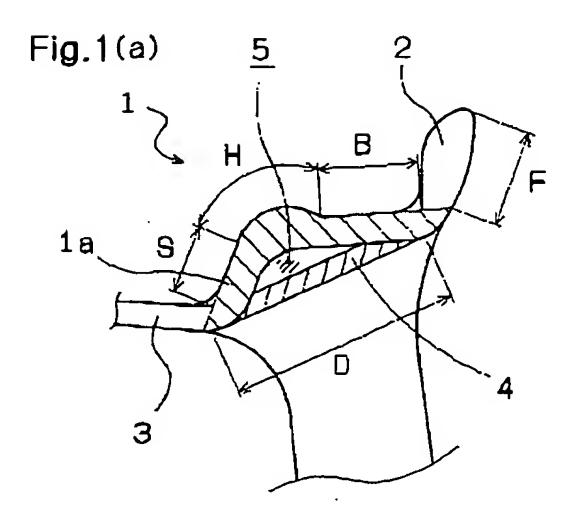
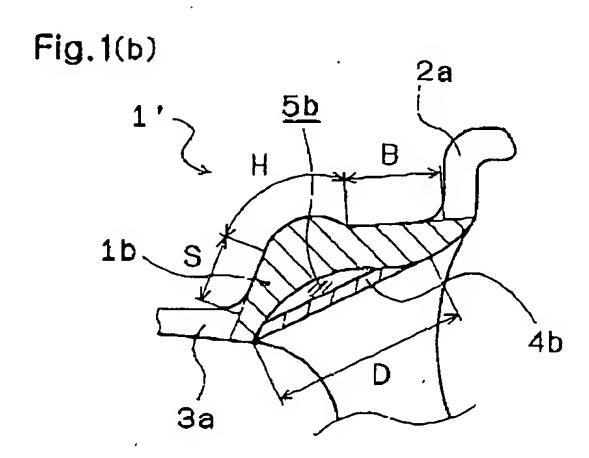
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Fig.2

Cross-sectional	Geometrical moments of	Aerial size of cross
shaping	inertia (mm4)	section (mm2)
Conventional shaping	I x-x	
2-1	31,512.2	
1	(100%)	247.6
Un X	I y-y 7 000 0	(100%)
5 Forging Ly	7,098.8 (100%)	
(2) ω	I X-X	
RIm_	32, 192.7	
1 8	(102%)	305.6
A Pima X	I y-y	(123%)
Rim4 Ly	8,797.28 (124%)	
(3) μω	I X-X	
	43, 122.5	
1/20	(137%)	345.2
A TE BX	I y-y 15,053.6	(139%)
W Ly	(212%)	
(4) ω	I ×-×	<u> </u>
	29,083.1	
	- <u>- (</u> 92%)	287.1
A X	I y-y 7,608.4	(116%)
Y O Ly	(107%)	
(5) ω	I x-x	
( 7	52, 124.1	
1/4	(165%) 	364.6
X	17,528.8	(147%)
D Ly	(247%)	·
(6)	I x-x	
W W	35, 362, 8	
3/(10)	(112%) 	365.1
X	22, 723.6	(147%)
у	(320%)	
$(7)$ $\omega$	I x-x	
al ROTT	50, 266.7	
R11	(160%) 	354.9
1 ×	22, 639.4	(143%)
¯ω Ly	(319%)	

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Fig.3

	<b>V</b>	
Cross-sectional shaping	Geometrical moments of inertia (mm4)	Aerial size of cross section (mm <sup>2</sup> )
Conventional shaping 3-1 Casting x	I x-x 38,268.0 (100%) I y-y 14,054.8 (100%)	371.5 (100%)
(2)  Rim4b  y	I x-x 32,192.7 (84%) I y-y 8,797.28 (63%)	305.6 (82%)
(3) (3) (3) (3) (3) (4) (3) (4) (4) (4) (4) (4) (4) (4) (4) (4) (4	I x-x 43,122.5 (113%) I y-y 15.053.6 (107%)	345,2 (93%)
(4) (4) (A) (A) (A) (A) (A) (A) (A) (A) (A) (A	I x-x 29,083.1 (76%) I y-y 7,608.4 (54%)	287.1 (77%)
$(5)$ $\downarrow \qquad \qquad$	I x-x 52, 124.1 (136%) I y-y 17, 528.8 (125%)	364.6 (98%)
(6) (6) (8) (8) (8) (8) (8) (8) (8) (8) (8) (8	I x-x 35,362.8 (92%) I y-y 22,723.6 (162%)	365.1 (98%)
(7) (8) (R11 × × y	I x-x 50,266.7 (131%) I y-y 22,639.4 (161%)	354.9 (96%)

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Fig.4

	Geometrical	Aerial size of cross
Cross-sectional shaping	moments of	ation
	inertia (mm <sup>4</sup> )	section (MM2)
Conventional shaping	I x-x	
3-1 Casting	38, 268.0	
	(100%)	371.5
x	I y-y	(100%)
	14,054.8	(200%)
у	(100%)	
(2)	I x-x	
	19,711.4	
	(52%)	125.3
X	I y-y	(34%)
+=1	8,050.8	
<u> </u>	(57%)	
(3)	I x-x 34,821.2	
	(91%)	
	I y-y	223.8
A N X	12,899.5	(60%)
	(92%)	
	I x-x	
$(4)$ $\omega$	45,708.5	
1 7/3	(119%)	040 5
1/	I y-y	310.5 (84%)
3 60	16, 168.0	(04%)
у	(115%)	
(5) 4	I x-x	•
	53, 876.1	
1/4	(141%)	391.3
X	I y-y	(105%)
4 4	18,346.4	<b>(</b> 1) 0 1 0 1
у	(131%)	
$(5') \frac{3.75}{}$	I X-X	
	51, 910.5	
3.75	(136%)	371.2
X	I y-y	(100%)
3.75 J	17,875.1 (127%)	
(6) UI /	I x-x 59,806.5	
75	(156%)	
14	I y-y	462.0
X X	19,703.0	(124%)
	(140%)	
<u> </u>		

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Fig.5

Cross-sectional shaping	Geometrical moments of inertia (mm4)	Aerial size of cross section (mm²)
$\begin{pmatrix} 1 & 1 & 1 \\ 2 & 1 & 1 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \\ 2 & 2 & 2 \\ 2 & 2 &$	I x-x 64,232.0 (168%) I y-y 20,479.2 (146%)	525.2 (141%)
(8) X X X X X X X X X X X X X X X X X X X	I x-x 67,043.7 (175%) I y-y 20,852.2 (148%)	579.5 (156%)
(9) $X$ $Y$	I x-x 68,600.2 (179%) I y-y 20,988.3 (149%)	623.5 (168%)

Fig.6

1 19.0					
Wall thick -ness	Ix-x	Iy-y	Aerial size of section S	Ix-x/S	Iy-y/S
t=1	19711.4	8050.8	125.3	157.3	64.3
t=2	34821.2	12899.5	223.8	155.6	57.6
t=3	45708.5	16168.0	310.5	147.2	52.1
t=4	53876.1	18346.4	391.3	137.7	46.9
t=5	59806.5	19703.0	462.0	129.5	42.6
t=6	64232.0	20479.2	525.2	122.3	39.0
t=7	67043.7	20852.2	579.5	115.7	36.0
t=8	68600.2	20988.3	623.5	110.0	33.7

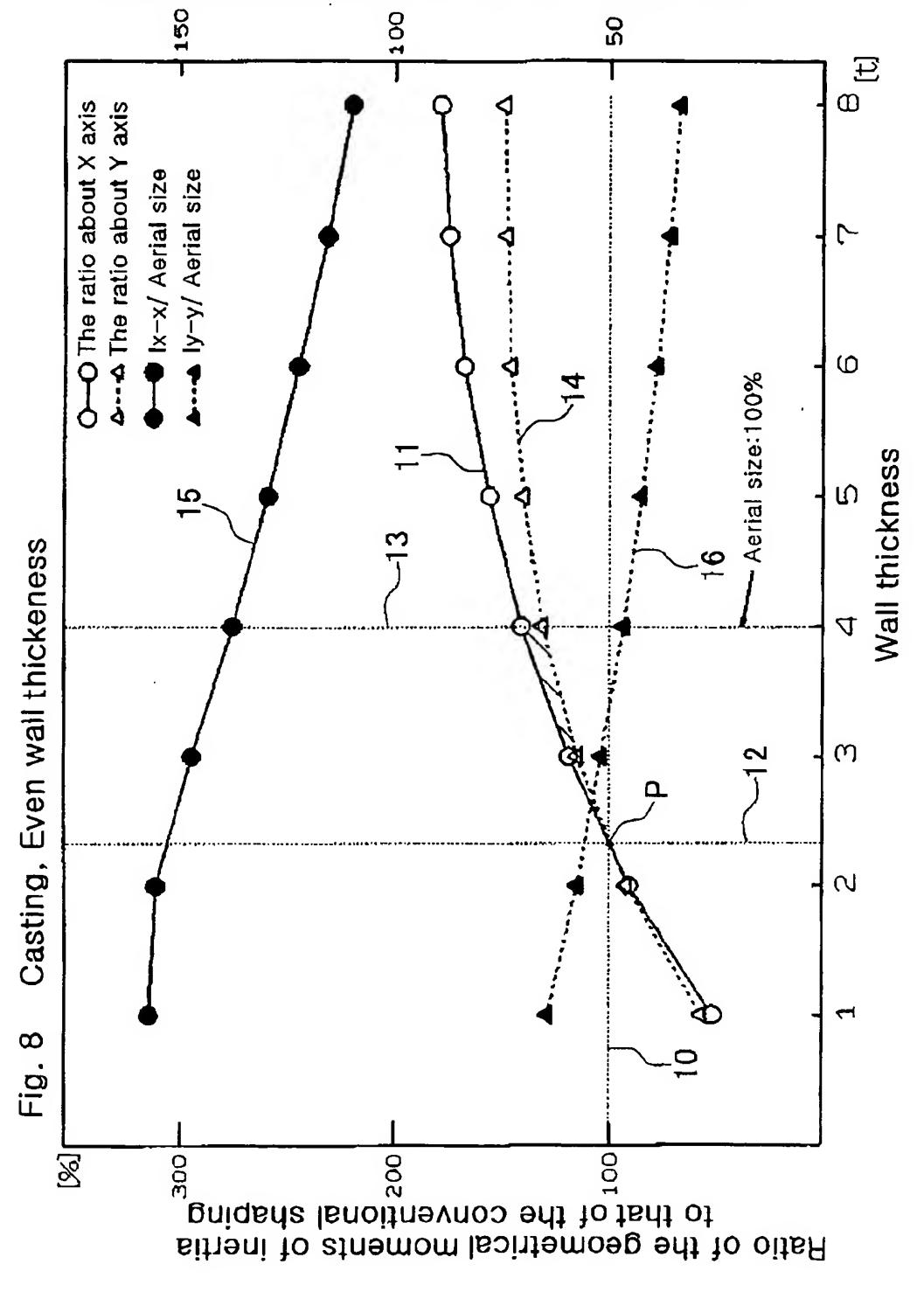
Inventor: Kotaro ONO Customer No.: 000028107

Fig.7

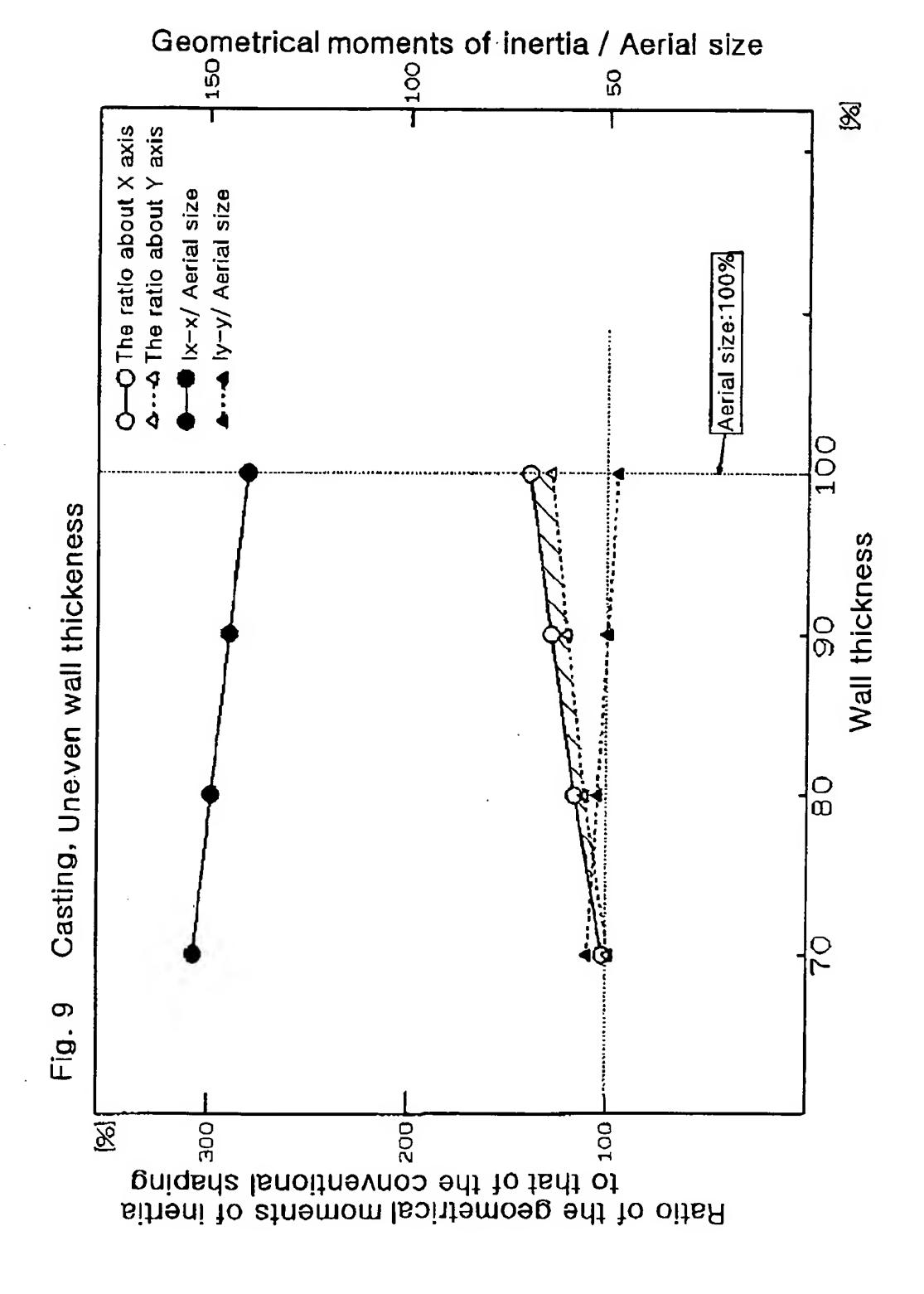
Cross-sectional	Geometrical moments of	Aerial size of cross
shaping	inertia (mm <sup>4</sup> )	section (mm2)
Conventional shaping	I x-x	
3-1 Casting	38, 268.0	
	(100%)	
	T y-y	371.5
\ // ×	14,054.8	(100%)
	(100%)	
(2)	I x-x	
1 2	39, 197.2	
1 N /2	(102%)	
	T V-V	254.8
1/3 IN PAY	13,942.5	(69%)
\ \_y	(99%)	
7-3	I X-X	
27	44,507.1	
12.5	(116%)	
11	I y-y	298.2 (80%)
3.5 0	15,562.6	(60%)
y -3 W	(111%)	
(4)	$I \times - \times$	
	49, 112.3	
3 7/3	(128%)	339.5
/ Xo x	I y-y	(91%)
A W	16,890.7	
у	(128%)	
(5)	$I \times X - X$	
1	52,362.6	
3.3	(137%)	371.3
A COX	I y-y	(100%)
4.5 w	17,770.6 (126%)	
<u> </u>	(12070)	

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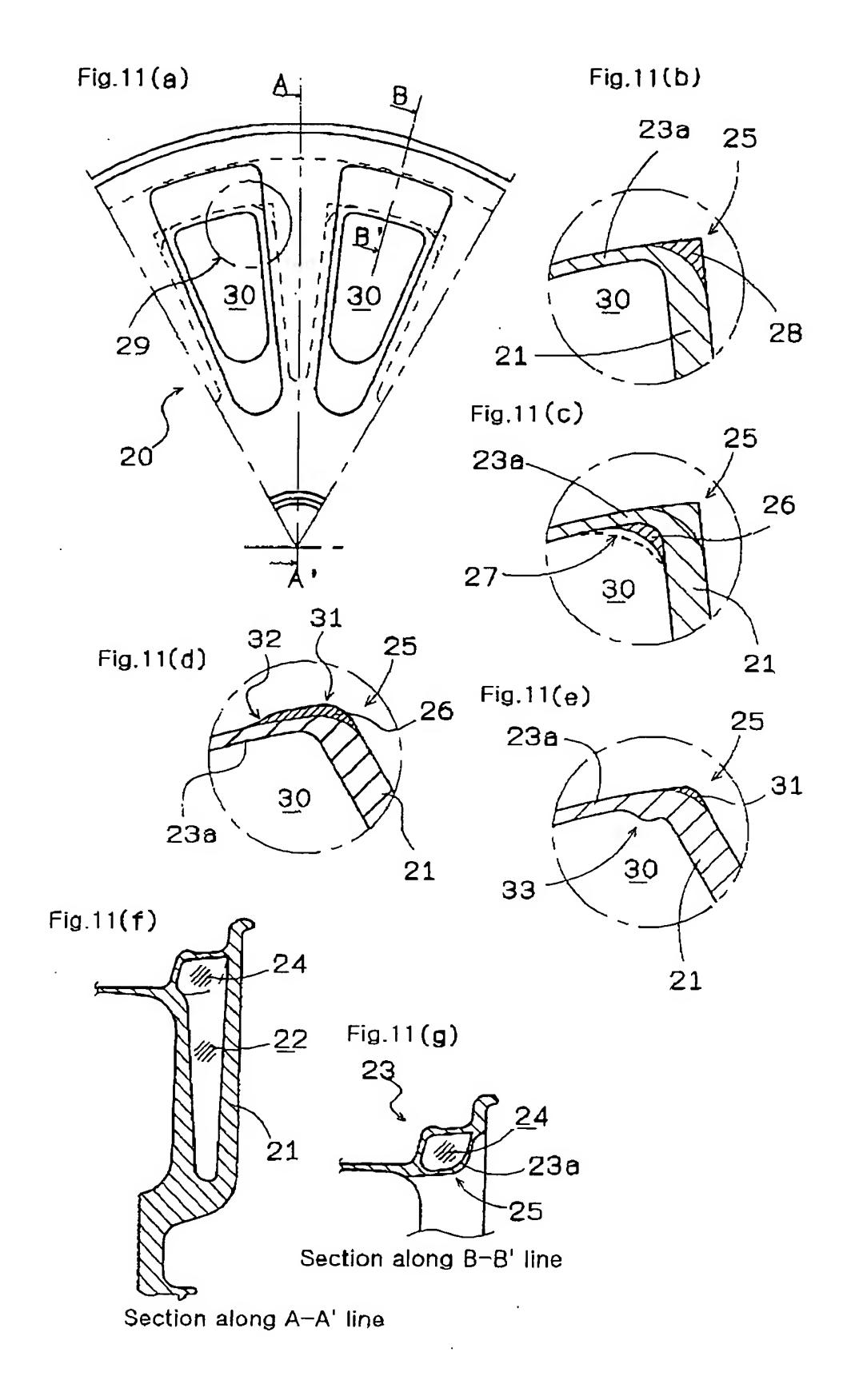


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Fig. 10

Cross-sectional shaping	Geometrical moments of inertia (mm4)	Aerial size of cross section (mm2)
Conventional shaping 3-1 Casting x L y	I x-x 38,268.0 (100%) I y-y 14,054.8 (100%)	371.5 (100%)
7-3 in Fig.7 as basic	I x-x 44,507.1 (116%) I y-y 15,562.6 (111%)	298.2 (80%)
(1) 5.5 2.5 X y	I x-x 45,706,5 (119%) I y-y 15,665.3 (111%)	298.4 (80%)
(2) 3.5 × × × × × × × × × × × × × × × × × × ×	I x-x 44,472,3 (116%) I y-y 15,117,2 (108%)	298.2 (80%)
(3) (3) x x y	I x-x 43,636.6 (114%) I y-y 15,747.6 (112%)	298.2 (80%)

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